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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/228,148 | 01/11/1999 | YASUNORI INOUE | 970150A | 7239 |

23850 7590 06/27/2003

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WASHINGTON, DC 20006

| EXAMINER |
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MALDONADO, JULIO J

| ART UNIT | PAPER NUMBER |
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2823

DATE MAILED: 06/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/228,148

Applicant(s)

INOUE ET AL.

Examiner

Julio Maldonado

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2003 and 27 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 29.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

The finality of the office action mailed 2/26/03 is withdrawn in view of the new grounds of rejection below.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-13 and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Leong.

Leong discloses sequential formation of conductive layer 12, oxide layer 13, 1000-2000 Å oxide/5000-6000 Å BPSG or PSG layer 16, conductive layer 20, 3000-4000 Å oxide layer 22, 2000-2400 Å SOG layer 24 and further oxide layer 26. Conductive layer 12 and layer 16 are patterned. The reference discloses implantation of Ar ions at a dose of $5 \times 10^{-15} - 1 \times 10^{16} \text{ cm}^{-2}$ and an energy of 40-140 KeV to cure layer 24. The reference indicates the energy and dose to affect breakdown voltage and volume shrinkage (col.4, lines 33-43 and col.5, lines 49-51).

Applicant indicates that 140 KeV implantation through a 4000 Å SOG layer penetrates the layer (instant pages 14-16). Therefore, at least a portion of the range of energies disclosed as suitable by Leong would penetrate the thickness of SOG disclosed by Leong. Applicant also indicates that 2000 Å of oxide is sufficient to substantially prevent penetration to the underlying metal. Therefore, the 3000-4000 Å oxide

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layer 22 would prevent ion penetration into conductive layer 20 and the 3000-4000 Å oxide layer 22 in combination with the 1000-2000 Å oxide/5000-6000 Å BPSG or PSG layer 16 would prevent penetration into conductive layer 12.

With respect to claim 11, layer 22 is composed of plural oxide layers formed on conductive material 20. Alternatively, layers 22 and 16 are formed on conductive material 12. With respect to claim 12, the reference discloses forming oxide layers by plasma CVD (col.3, lines 28-30 and instant page 21).

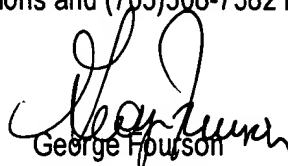
Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leong as applied to claims 9-13 and 15-18 above, and further in view of Wolf, as previously applied.

Wolf is applied as suggesting use of SOG having the recited C content as stated in the office action mailed 2/26/03.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956. See MPEP 203.08.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Julio Maldonado whose telephone number is (703) 306-0098. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794. The fax number for this group is (703)308-7722 (or extensions 7724, 3431 or 3432) for regular communications and (703)308-7382 for after final communications.


George Houson
Primary Examiner
Art Unit 2823

JMaldonado
June 24, 2003